Amendments to the Claims

Please cancel Claim 68. Please amend Claims 54, 63, and 89. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1-53 Cancelled

54. (Currently Amended) A method for at least partially suppressing a vibration of a mechanical disturbance, comprising:

measuring a characteristic of the disturbance using a sensor; and

based on the measured characteristic, actuating at least one active switch of an electrical circuit to cause an electromechanical transducer coupled to the disturbance <u>by a mechanical amplifier</u> to act on the disturbance to at least partially suppress the vibration.

55. (Previously Presented) The method of claim 54, wherein the transducer at least approximately matches a phase of the disturbance to at least partially suppress the vibration.

56. (Presently Presented) The method of claim 54, wherein the transducer at least approximately matches a motion of the disturbance to at least partially suppress the vibration.

57. Cancelled.

58. (Previously Presented) The method of claim 54, wherein the measured characteristic is selected from the group consisting of: vibration amplitude, vibration frequency, vibration mode, physical strain, position, displacement, pressure, voltage, current, temperature, humidity, altitude, force, orientation, acceleration, motion, a physically measurable

quantity corresponding to a mechanical or electrical property, a rate of change of a subset thereof, and a combination thereof.

59. (Previously Presented) The method of claim 54, wherein the sensor is selected from the group consisting of: strain gauge, pressure sensor, PVDF film, accelerometer, active fiber composite sensor, composite sensor, and a combination thereof.

60. (Previously Presented) The method of claim 54, including using the transducer to convert at least a portion of mechanical energy of the disturbance to electrical energy, and applying at least a portion of the electrical energy to the transducer.

61. (Previously Presented) The method of claim 54, including using the transducer to convert at least a portion of mechanical energy of the disturbance to electrical energy, and applying at least a portion of the electrical energy to the electrical circuit.

62. (Previously Presented) The method of claim 54, including using the transducer to convert at least a portion of mechanical energy of the disturbance to electrical energy, and applying at least a portion of the electrical energy to the sensor.

63. (Currently Amended) A system for at least partially suppressing a vibration of a mechanical disturbance, comprising:

an electromechanical transducer coupled to the disturbance <u>by a mechanical amplifier</u> and configured for exchanging mechanical energy with the disturbance;

a sensor for measuring a characteristic of the disturbance; and

an electrical circuit in communication with the sensor and coupled to the transducer for causing the transducer to act on the disturbance to at least partially suppress the vibration, based on the measured characteristic, wherein the electrical circuit includes at least one active switch.

64. (Previously Presented) The system of claim 63, wherein the transducer at least approximately matches a phase of the disturbance to at least partially suppress the vibration.

65. (Previously Presented) The system of claim 63, wherein the transducer at least approximately matches a motion of the disturbance to at least partially suppress the vibration.

66. (Previously Presented) The system of claim 63, wherein the transducer is selected from the group consisting of: piezoelectric transducer, antiferroelectric transducer, electrorestrictive transducer, peizomagnetic transducer, magnetostrictive transducer, magnetic shape memory transducer, and a combination thereof.

67. (Previously Presented) The system of claim 63, wherein the sensor is selected from the group consisting of: strain gauge, pressure sensor, PVDF film, accelerometer, composite sensor, and a combination thereof.

68. (Cancelled)

69. (Previously Presented) The system of claim 63, wherein the transducer is coupled to the disturbance by a hydraulic amplifier.

70. (Previously Presented) The system of claim 63, wherein at least one of the at least one active switch is selected from the group consisting of: MOSFET, bipolar transistor, ZGBT, SCR, and a combination thereof.

71. (Previously Presented) The system of claim 63, wherein at least one of the at least one active switch includes a diode.

72. (Previously Presented) The system of claim 63, wherein the electrical circuit includes a resonant circuit to at least approximately match a characteristic of the vibration.

73. (Previously Presented) The system of claim 72, wherein the resonant circuit is coupled to the transducer to at least approximately match a behavior of the transducer.

74. (Previously Presented) The system of claim 72, wherein the resonant circuit includes at least one capacitor.

75. (Previously Presented) The system of claim 72, wherein the resonant circuit includes at least one inductor.

76. (Previously Presented) The system of claim 63, wherein the electrical circuit includes a control circuit for controlling at least one of the at least one active switch.

77. (Previously Presented) The system of claim 76, wherein the controlling employs a method selected from the group consisting of: rate feedback, positive position feedback, position-integral-derivative feedback (PID), linear quadratic Gaussian (LQG) control, model-based control, a dynamic compensator-based control, and a combination thereof.

78. (Previously Presented) The system of claim 76, wherein the controlling includes adjusting a duty cycle of the at least one of the at least one active switch, to configure the transducer for at least approximately matching a behavior of the disturbance.

79. (Previously Presented) The system of claim 78, wherein the behavior of the disturbance includes a frequency of the vibration.

80. (Previously Presented) The system of claim 78, wherein the behavior of the disturbance includes a phase of the vibration.

81. (Previously Presented) The system of claim 63, wherein electrical energy supplied to the transducer is derived at least in part from a subset of energy extracted from the mechanical disturbance.

82. (Previously Presented) The system of claim 63, wherein the electrical circuit includes an amplifier circuit coupled to the transducer for providing energy exchange between the electrical circuit and the transducer.

83. (Previously Presented) The system of claim 82, wherein the amplifier circuit is selected from the group consisting of: a switching amplifier, a switched capacitor amplifier, a capacitive charge pump, an H-bridge amplifier, a half-bridge amplifier, and a combination thereof.

84. (Previously Presented) The system of claim 82, wherein the electrical circuit includes a control circuit for controlling the amplifier circuit.

85. (Previously Presented) The system of claim 84, wherein the controlling employs a method selected from the group consisting of: rate feedback, positive position feedback, position-integral-derivative feedback (PID), linear quadratic Gaussian (LQG) control, model-based control, a dynamic compensator-based control, and a combination thereof.

86. (Previously Presented) The system of claim 84, wherein controlling the amplifier circuit includes adjusting a duty cycle of at least a portion of the amplifier circuit, to configure the amplifier circuit for at least approximately matching a behavior of the disturbance.

87. (Previously Presented) The system of claim 63, wherein the electrical circuit includes a rectifier circuit.

88. (Previously Presented) The system of claim 87, wherein the rectifier circuit is coupled to the transducer.

89. (Currently Amended) A system for at least partially suppressing a vibration of a mechanical disturbance, comprising:

an electromechanical transducer coupled to the disturbance by a mechanical amplifier and configured for converting at least a portion of mechanical energy associated with the disturbance to electrical energy;

an electrical circuit coupled to the transducer to process at least a portion of the electrical energy, wherein the electrical circuit includes at least one active switch; and

dissipating at least a portion of the processed electrical energy, thereby at least partially suppressing a vibration of the disturbance by reducing the mechanical energy associated with the disturbance.

90. (Previously Presented) The method of claim 54, wherein all electrical energy supplied to at least one of the transducers, the electrical circuit, and the sensor is derived solely from a subset of energy extracted from the mechanical disturbance.

91. (Previously Presented) The system of claim 63, wherein all electrical energy supplied to at least one of the transducer, the electrical circuit, and the sensor is derived at least in part from a subset of energy extracted from the mechanical disturbance.

92. (Previously Presented) The system of claim 91, wherein all electrical energy supplied to at least one of the transducer, the electrical circuit, and the sensor is derived solely from a subset of energy extracted from the mechanical disturbance.

93. (Previously Presented) The system of claim 63, wherein the measured characteristic is selected from the group consisting of: vibration amplitude, vibration frequency, vibration mode, physical strain, position, displacement, pressure, voltage, current, temperature, humidity, altitude, force, orientation, acceleration, motion, a physically measurable quantity corresponding to a mechanical or electrical property, a combination thereof, and a rate of change of the combination thereof.